REMARKS

Claims 1-25 are pending. By this Amendment, the specification and claims 1, 8, 11 and 18 are amended and claims 20-25 are added. Reconsideration in view of the above amendments and following remarks is respectfully requested.

Claims 1-19 were rejected under 35 U.S.C. § 102(e) over Takano (U.S. Patent Application Publication 2002/0020344 A1). The rejection is respectfully traversed.

The Examiner alleges on pages 2-3 of the Office Action that Takano provides a separate vacuum pump to each of the chambers and that the system is capable of producing a super-high vacuum of 10^{-6} Pa (10^{-8} mbar), then it is implied that Takano can reach any of the partial pressures recited in claims 1-19. It is respectfully submitted that although Takano discloses in his discussion of the prior art (in paragraph [0010]) that pumps are known which can produce a super-high vacuum, the controller 12 of Takano is not configured to control any of the pumps 4 to produce a super-high vacuum in any of the chambers 1, 2 and 3.

Takano disclose in paragraphs [0042] – [0052] a method of contamination analysis including S1: A silicon substrate whose surface has undergone a cleaning processing such as the removal of a natural oxidation film is put into the load-lock chamber. S2: The atmosphere in the load-lock chamber is replaced. S3: The silicon substrate is moved through the transfer chamber to the process chamber. S4: A polycrystalline silicon film is deposited in a thickness of 50 nm on the silicon substrate in the process chamber. The polycrystalline film formation conditions are as follows: 1 Processing temperature: 650°C; SiH_4 flux: 0.3 slm; Pressure: 133 Pa. S5: After film formation in the process chamber, the silicon substrate is returned to the load-lock chamber. In the steps S2 to S5, samples are produced at the following two settings for the silicon substrate transfer pressure: (a) 0.1 Pa or less: conventional setting (under the attainable vacuum resulting from evacuation by the vacuum pumps); (b) 133 Pa: present embodiment setting (N_2 gas exhausted while being introduced). S6: The load-lock chamber is returned to atmospheric pressure. S7: The silicon substrate is taken out of the load-lock chambers and the silicon substrate surface is analyzed for contamination. The contamination analysis method involved using SIMS (Secondary Ion Mass Spectroscopy) to analyze the carbon concentration at the interface (analysis plane) between the silicon substrate and the polycrystalline silicon film (50 nm) deposited on the silicon substrate in the above steps.

Takano further discloses in paragraph [0057] that with this embodiment, since the inert gas is supplied to and exhausted from all of the chambers, which prevents the reverse

diffusion of oil from the vacuum pumps, there is no need to provide each chamber with a turbo molecular pump that has little reverse diffusion of oil, or to modify the members inside the transfer chamber (such as using metal O-rings), or to employ means for lowering the partial pressure of impurities in the transfer space by using a super-high vacuum of about 10^{-8} Pa. Therefore, there is no need to raise the pressure of the process chamber up to the film formation pressure, and there is none of the attendant decrease in throughput. As a result, the cost is low and maintenance is easy with this embodiment. In other words, Takano's invention is a method which eliminates the need to use turbo molecular pumps, or other pumps capable of achieving super-high vacuums of 10^{-8} Pa.

As discussed above, the lowest pressure used in steps S1-S7 of Takano's method is 0.1 Pa (i.e., 10^{-3} mbar). Takano thus does not disclose or suggest controlling partial pressures as low as 10^{-4} and 10^{-6} mbar, as recited in claims 1 and 11.

It is further respectfully submitted that Takano does not disclose or suggest controlling the partial pressure of different contaminants to different levels, as recited in claims 1 and 11. Takano merely disclose in paragraphs [0048] – [0050] producing samples at (a) 0.1 Pa (10^{-3} mbar) or less (i.e., under the conventional setting) or (b) 133 Pa (i.e. 1.33 mbar) (N_2 gas exhausted while being introduced) (i.e., under Takano's inventive setting).

Claims 2-10 and 12-19, and new claims 20-25, recite additional features of the invention and are allowable for the same reasons discussed above with respect to claims 1 and 11 and for the additional features recited therein.

Reconsideration and withdrawal of the rejection of claims 1-19 under 35 U.S.C. § 102(e) over Takano are respectfully requested.

In view of the above amendments and remarks, it is respectfully submitted that all of the claims are allowable and the entire application is in condition for allowance.

Should the Examiner believe anything further is desirable to place the application in condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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